AMATEUR SATELLITE REPORT

AMSAT's Newsletter for the Amateur Space Program.

Amateur Satellite Report is endorsed by the American Radio Relay League as the special interest Newsletter serving the Amateur Radio Satellite Community

Number 50
January 17, 1983

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Short Bursts

•No decision yet on the W5LFL-carries-an-HT-on-Shuttle-flight yet. It was thought a decision would be made by NASA on the joint AMSAT/ARRL proposal by year's end but unforeseen issues have dimmed prospects somewhat. *ASR* has learned that while NASA public relations officials and the astronaut corps are generally in favor of allowing Owen Garriot, W5LFL, to be the first ham to operate from space, various technical and political questions remain unanswered.

•W4EWB and HP1AC report strange telemetry indications on RS-5 channel G. The tentative conclusion is that UA3CR (operating as 4KIG, see *ASR* 48/49) is loading RS-5 codestore from his DXpedition QTH in Antarctica. Leo could also be enroute by ship in the southern hemisphere and operating as EK3CR, *ASR* has been informed. The anomalous telemetry are presumably indicators that codestore load is in progress. According to a table of telemetry in *RADIO* #9, September, 1982, page 6, channel G is a "service parameter" as is channel U. No values are given for the channels. These two are the only ones in the entire set for which no values are given.

•WA1ZUB has earned his satellite WAS award. Congratulations to Jim!

•TU2IT has returned to Ivory Coast from France and will be active on Mode A for several months. QSL to Michael at BP 302, San Pedro, Ivory Coast.

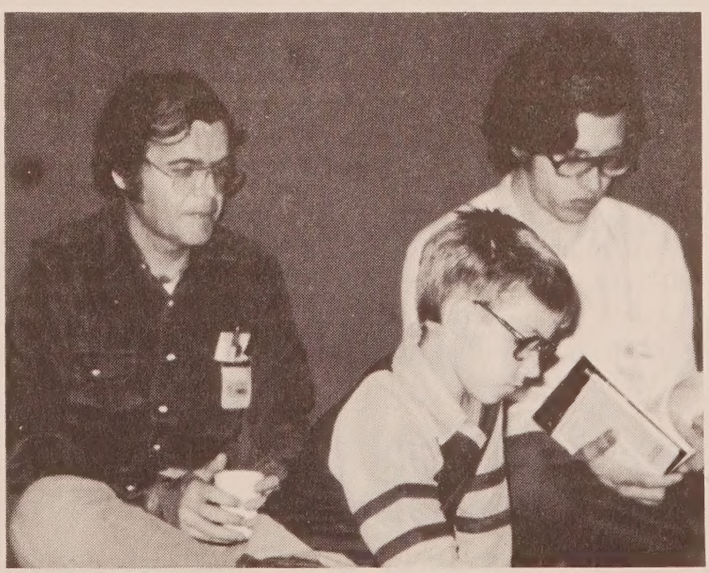
•Birger Lindholm of Finland is now convinced RS-1 is at least partially operational. He claims to have heard the beacon at 29.401 MHz. Other reports had it that the transponder has been worked although confirmation has not been made of this claim. Based on his analysis, Birger says a reference orbit for RS-1 for 1 Jan. 83 was 00:55:41 at 94.75 deg. West. His estimated period is 120.385047 minutes and his estimated longitude increment is 30.226167 degrees.

•According to Birger Lindholm, UK3ABT remarked to LZ1AB on 26 Dec. 82 that ISKRA-3 died in the late evening of 25 December on orbit 527. At that time according to Lindholm the altitude was only 150 km. UK3ABT, Sergei, told LZ1AB, Vasil (See *ASR* #32) that ISKRA-3 had lived 4 days longer than they had expected. G3IOR had previously said he thought ISKRA-3 expired at 1802 UTC, 25 Dec. when the transponder suddenly went dead. Pat also said he has learned that there may be as many as 20 ISKRAs in the program with the next amateur radio ISKRA expected this December. ISKRA is the Russian word for "Spark." Not all ISKRAs will be amateur radio satellites. ISKRAs are built at the Moscow Aviation Institute while the RS-series satellites are built by DOSAAF, a Russian paramilitary organization similar to the U.S. Civil Air Patrol.

•Fans of "Freddie" take heart. The series, "Fred Works OSCAR," begun in *Orbit* 9, continued in 10, will pick up again in *ORBIT* 13.

•AMSAT's General Manager Selection Committee interviewed seven finalist candidates 8 and 9 Jan. 83. No date has been set for announcing the final selection but the intent was to hire the successful candidate with an effective starting date just before the Phase IIIB launch. Another candidate was interviewed earlier during the Christmas holiday period. A total of about fifteen finalists were called from over one hundred applications for the position. The number was pared down to the present eight recently.

•The long-awaited release of the K2UBC satellite book moved a step closer when last week the book was assigned to the production department at ARRL. The League commissioned the book, one of the most informative



K2UBC, Ian King (harmonic of W3GEY) and KA9Q.

documents ever compiled in the field of amateur satellites, from Dr. Marty Davidoff, K2UBC, a professor of mathematics and former AMSAT Director. AMSAT has a distributor agreement with ARRL and will be offering the book upon its release. The book will similarly be offered in all regular ARRL bookstores and distributors, but AMSAT will realize a small commission for each copy sold through P.O. Box 27! Don't send in any checks yet, however, because the exact release date and price have not been finally determined at this writing.

•UoSAT will resume its preholiday schedule and should be ready for boom deployment as you read this. Copies of the IERE Journal dedicated to UoSAT containing papers by the University of Surrey and contributing workers is available from AMSAT HQ for $10, postpaid to U.S., Canada and Mexico.

•A special Annual Report has been sent to all 1982-current annual members. The report reviews AMSAT's year, 1982. A renewal form and return envelope are enclosed. So far the renewal response has been very strong. Life members will receive their personal copies of the Annual Report along with *ORBIT* #12 now scheduled for mailing late January. The issue is at the printers at this time. Previously expired members will receive a renewal reminder only but can request a copy of the Annual Report by sending a 5" by 7" (13 cm by 18 cm) self-addressed envelope with 6 IRCs to : AMSAT Annual Report Offer, 221 Long Swamp Road, Wolcott, CT, 06716. A $10 donation together with a renewal will garner a copy of the report by AIR MAIL. Be sure to specify you want the special AIR MAIL with your donation.

•ARRL announces they have a new *QST Satellite Bibliography* available. Twenty pages long, the list cites year, month, title, author, page and quantity of pages for each relevant *QST* article published since 1961. A similar list of relevant Strays since 1978 also is complete. Both lists may be obtained from ARRL free of charge if you will send a self-addressed, business sized envelope stamped with three units of postage. Mail to: ARRL, 225 Main Street, Newington, CT, 06111, Attn: *QST Satellite Bibliography* (*QST*, Jan. 83, p. 88)

•The KA9Q Phase IIIB orbit simulation video tape has proved to be very popular. To broaden its availability, three new tapes of the computer simulation are being added to the AMSAT Videotape Library. For borrowing a tape, write:

AMSAT Videotape Library
Roger Johnson, WBØGAI
1627 36th Ave. Court
Greeley, CO, 80634

A nominal $25 deposit is required against the return of the tape. Write for complete instructions. Reserve early for your spring club meetings!

•K9CIS cautions that AO-8's battery is getting old; bears watching.

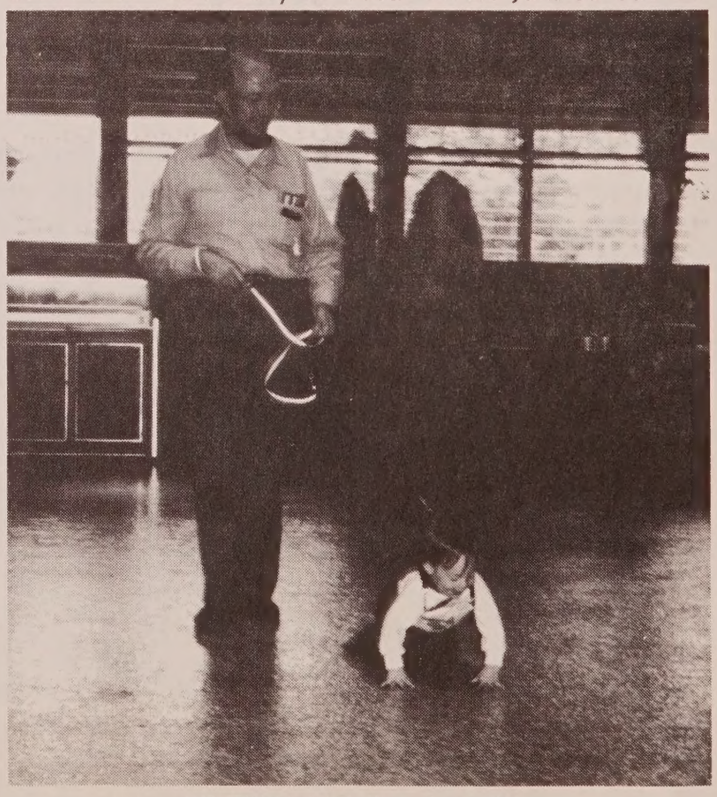
Cosmos Satellite Fall Known To Amateurs

The imminent demise of the Soviet spy satellite, COSMOS 1402 in late January, has thrust world attention on amateur satellite tracking expert Geoffrey Perry of Kettering, England. Perry, a 55 year old physics teacher at an exclusive boy's school in the English midlands, had previously become known to the world press in connection with his uncanny knowledge of super-power satellite operations by simply listening and observing with amateur SWL equipment. He and his gifted students were the first to reveal publicly the existance of a secret Russian launch site at Plesetsk. Amateur satellite RS-1 was launched from there in 1978. Perry and his pupils deduced the site's existance based on the trajectories of satellites, the timing of their transmissions and other passive observation.

Now Perry has confirmed "leaks" to the media (prosumably from U.S. intelligence sources) that COSMOS 1402 malfunctioned during a maneuver that was intended to boost its radioactive power plant into a higher, long-lived orbit. COSMOS 1402 is one of a series of ocean surveillance radar satellites launched by the USSR. Typically they orbit at 150 miles inclined 65 degrees. Six months is the expected life of such an orbit. COSMOS 1402 was launched 30 Aug. 82. The maneuver 28 Dec. 82 was designed to split the spacecraft into three segments and to boost the heavy reactor to 600 miles where orbital longevity is at least several hundred years. Apparently Perry monitored the boost attempt event and noted discrepancies between the performance of the reactor section on this occasion compared to prior, successful boost operations. It is to be expected that other nations monitor space events as does Mr. Perry. Mr. Perry is often, by contrast, available to the media for comment on these occasions.

Perry says his tracking and analysis is based on observation and coordinated with unclassified orbital data obtained from the Goddard Space Flight Center in Maryland.

Meanwhile, U.S. officials predicted that the deorbit event was most likely to occur on 24 Jan. 83 but em-



WB2TNC with tethered satellite.

phasized the extreme difficulty of making predictions more than a day in advance as regards the primary impact area and the exact decay time.

Perry was interviewed in connection with COSMOS 1402 on U.S. network television and explained how he came to believe the spy satellite was in trouble. On 21 Feb. 82 he appeared in a "60 Minutes" segment on CBS, one of the highest rated TV programs in the world. Since then he has been a celebrity in the world of amateur space activities consistently dazzling reporters with the simple elegance of his technique and the sheer brilliance of his rigorously logical mind. Sherlock Holmes would envy Perry, it is said. Perry tends to downplay the satellite tracking activity, however, and points out that this pasttime is reserved for weekends, holidays and recreation periods. He also keeps in touch with other amateur trackers in New Zealand, U.S. and Sweden, according to Perry.

South American Chief A.C. Tapped

Carlos Huertas, LU4ENQ, AMSAT Area Coordinator for Argentina has been named Chief AMSAT Area Coordinator for South America. Carlos has also agreed to serve as AMSAT Phase IIIB Special Service Channel Coordinator for that continent.

LU4ENQ will join the growing number of Phase IIIB Bulletin Stations who will be using the Special Service Channels (SSCs) after the satellite goes into its operational phase. Transmissions from LU4ENQ will be primarily in Spanish with a target audience of Radio Amateurs in South and Central America as well as the islands in the Caribbean. These transmissions will use information received via satellite from the Phase IIIB General Beacon as well as from other Bulletin stations and will include news of Radio Amateur Satellite matters, radio propagation, DX and other information of general interest to the Spanish speaking community. Assisting Carlos, LU4ENQ, will be AMSAT members, LU8EIC and LU8DYF.

Carlos is a contributing editor for the Spanish language ham magazine *REVISTA*, the monthly publication of RCA, the Radio Club of Argentina. He writes a monthly column on VHF and satellites, providing the latest info on these matters to interested hams in LU land. When not at work (IBM Argentina) Carlos uses his TRS-80 Color 32K computer to perform AMSAT related chores such as generating orbital data for monthly publication in *REVISTA*, transmitting BASIC satellite programs on FM-AFSK on the LU AMSAT Net, keeping a FILE of satellite users and local area coordinators, making mailing labels for local radio clubs as well as a number of other computer tasks. Congratulations and thanks to Carlos and his dedicated assistants — *K1HTV*

"Low Cost Tracking Computer Moves Ahead"

The AMS-81 project as outlined in *ORBIT* #11, "Low Cost Computer Project" by Bob Nickels, KEØT, has been expanded and refined into software and hardware/software efforts involving several AMSAT volunteers. These efforts will lead to the availability of advanced scheduling and tracking capabilities for Phase II and Phase III satellites.

Providing scheduling and tracking information for Phase IIIB has become the priority objective for the AMS-81 project team. Present OSCAR operators have become proficient using the Project OSCAR-type polar plotters. Unfortunately, these methods will not work for the highly elliptical Phase III-type orbit. We will need a more sophisticated means to produce the required information. Our solution is to derive the information on a programmable device such as a small personal computer.

Two independent software efforts are currently underway to produce a scheduling and tracking program for use with a Sinclair ZX-81 or Timex Sinclair 1000 equipped with at least 16K of add-on RAM. Tom Clark, W3IWI, and Courtney Duncan, N5BF, are both well versed in the orbital mechanics, mathematics and "housekeeping" procedures necessary to produce required data. Completed software will be audited by several OSCAR operators with a mix of operational and tracking experience. The final result(s) will be professionally copied and made available through AMSAT volunteers in plenty of time for the Phase IIIB launch. This software will also be usable with shortlived Phase II type missions such as ISKRA 3 or STS.

Concurrently, but on a slightly longer schedule, a hardware project is underway to develop an automatic tracking capability based on the same Sinclair ZX-81 or Timex Sinclair 1000. This accessory hardware package will contain a realtime clock, digital-to-analog conversion for az-el rotor control, an ASCII RS-232 interface and a plug-on port for standard 16K memory packs. Specific devices to implement these features have been selected and the hardware is currently being constructed by the Juniata College Amateur Radio Society in Huntingdon, PA under the direction of Bill Blazina, K3EAV. The completed assembly and associated software will provide fully automated realtime tracking of Phase II and III satellites. Plans to provide this package in significant volumes are incomplete at this time.

AMSAT is undertaking these projects to ensure that individual operators have the ability to schedule Phase III operating periods and produce tracking information. AMSAT will regularly supply Keplarian data to input these programs just as EQX data is presently supplied for Phase II satellites. — *WØRPK*

Second ARRL Packet Conference Call for Papers

The ARRL is sponsoring a second Amateur Radio Computer Networking Conference on March 19, 1983 in San Francisao, CA. The conference will be in cooperation with the 8th West Coast Computer Faire being held March 18-20. This event will be hosted by the Amateur Radio Research and Development Corporation (AMRAD) and the Pacific Packet Radio Society (PPRS).

The deadline for camera-ready papers is February 5, 1983. All papers should be mailed to Paul L. Rinaldo,

W4RI, 1524 Springvale Avenue, McLean, VA, 22101. If you plan to present a paper, please request an author's guide and advise Paul of the title of your paper immediately. Proceedings for this conference will be separate from those for the Faire.

Technical papers are invited on all aspects of amateur packet radio, advanced radioteletype (RTTY) including AMTOR, and related Amateur Radio digital communications via hf, vhf/uhf and satellite media. Topics may include network and system architecture, proposed standards, hardware, software, protocols, modulation and encoding schemes, and applications. This is an excellent opportunity to have your ideas influence the future of amateur digital communications.

"Radio" Features Mobile/Portable Satcom

The back cover of the Russian magazine *RADIO* (#10, October 82) is shown here. Translation and materials by W4KM.

Above: Left—reception of greetings radiogramms addressed to the Komsomol Congress via the satellite "Radio-5" in the Central House of the Soviet Army in Moscow. Masters of Sport of the USSR G. Shul'gin and L. Labutin [UA3CR] are engaged in reception and demonstration of texts on the screen;

Right—earth station U3RS and RS3R, installed in a minibus. In the foreground, one of its operators, Master of Sport of the USSR V. Bagdyan.

Below: Left—Sportsmen of Belorussia, Masters of Sport of the USSR M. Stepanchuk, V. Chepyzhenko, and V. Artamonov carry out demonstration QSO's in Kaunas via the "Radio-7" satellite;

Right—Perm shortwaver A. Borisov, UA9FDZ, demonstrates his station for communication via satellite to Deputy Chairman of the Federation of Radio Sport of the USSR N. Kazanskiy and to Lithuanian shortwaver G. Gaydukov, UP2BFC.

Photos by V. Borisov

Keplerian Elements	AO-8	UO-9
Catalog Number	10703	12888
Epoch Time	82357.52928818	82359.34491153
Element Set #	718	371
Inclination	98.7653 deg.	97.5221 deg.
RA of Node	13.6029 deg.	320.4087 deg.
Eccentricity	0.0007902	0.0002335
Arg. of Perigee	94.0678 deg.	159.2724 deg.
Mean Anomaly	266.1311 deg.	200.8579 deg.
Mean Motion	13.96529651 rev/day	15.19879580 rev/day
Decay Rate	2.99e-06 rev/day/day	0.0001318 rev/day/day
Epoch Rev.	24472	6737
Semi Major Axis	7285.383 km	6885.860 km
Period	103.112741 min.	94.744348 min.
Apogee	933.778 km	511.955 km
Perigee	922.264 km	508.740 km

	RS-3	RS-4	RS-5	RS-6	RS-7	RS-8
Catalog Number	12997	13000	12999	13002	13001	12998
Epoch Time	82338.04775186	82359.30069511	82357.64241914	82353.63965564	82356.52863426	82359.29192115
Element Set #	45	68	58	41	80	171
Inclination	82.988 deg.	82.9591 deg.	82.9528 deg.	82.9599 deg.	82.9543 deg.	82.9565 deg.
RA of Node	84.2265 deg.	76.0331 deg.	77.5179 deg.	76.3819 deg.	76.6568 deg.	77.3949 deg.
Eccentricity	0.0059776	0.0018026	0.0010552	0.0051222	0.0023287	0.0018432
Arg. of Perigee	82.7944 deg.	98.8498 deg.	134.3256 deg.	64.6931 deg.	71.3335 deg.	172.1375 deg.
Mean Anomaly	277.9912 deg.	261.4593 deg.	225.8665 deg.	295.9427 deg.	289.0248 deg.	187.9950 deg.
Mean Motion	12.15574002 rev/day	12.06663096 rev/day	12.05042315 rev/day	12.13549221 rev/day	12.08671236 rev/day	12.02933192 rev/day
Decay Rate	-1e-07 rev/day/day	1.12e-06 rev/day/day	1.1e-07 rev/day/day	4e-08 rev/day/day	9.2e-07 rev/day/day	2.01e-06 rev/day/day
Epoch Rev	4272	4497	4471	4454	4471	4483
Semi Major Axis	7991.334 km	8030.615 km	8037.812 km	8000.217 km	8021.720 km	8047.201 km
Period	118.462553 min.	119.337370 min.	119.497878 min.	118.660206 min.	119.139097 min.	119.707396 min.
Apogee	1681.690 km	1687.511 km	1678.928 km	1680.266 km	1681.161 km	1684.283 km
Perigee	1586.152 km	1658.559 km	1661.965 km	1598.308 km	1643.801 km	1654.618 km

Amateur Satellite Report is published and mailed First Class bi-weekly by The Radio Amateur Satellite Corporation, P.O. Box 27, Washington, DC 20044 for the purpose of enhancing communications about the Amateur Radio Satellite Program. Subscription rate is $18.00 ($26.00 overseas) yearly by check or money order to "Satellite Report," 221 Long Swamp Road, Wolcott, CT 06716. Information published herein may be quoted without permission provided credit is given. Amateur Satellite Report is endorsed by the American Radio Relay League as the special interest newsletter serving the Amateur Radio Satellite Community. The editorial opinions expressed are not necessarily those of the ARRL.